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Mark A. Brogie

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## The Mute Swan in Nebraska: History and Current Status

Mark A. Brogie, Creighton, Nebraska

W. Ross Silcock, Tabor, Iowa (Corresponding Author: [silcock@rosssilcock.com](mailto:silcock@rosssilcock.com))

Joel G. Jorgensen, Lincoln, Nebraska

Mute Swans (*Cygnus olor*) were introduced into North America during the late 1800s as decorative waterfowl and have established feral populations (Ciaranca et al. 1997). Currently, the range of wild populations of Mute Swans in North America includes the Atlantic Coast from Maine to South Carolina and the Great Lakes, with the exception of Lake Superior where it is not established (Baldassarre 2014). The current total North American population is estimated to be 22,000-25,000 (Baldassarre 2014) and populations continue to increase (Petrie and Francis 2003). Indeed, the growing concern over burgeoning numbers has resulted in many states and municipalities implementing programs and procedures to reduce their Mute Swan populations.

Although Mute Swans displace native wildlife and negatively impact wetland habitats (Ellis and Elphick 2007), captive Mute Swans continue to be raised by aviculturists and are commonly used as decorative or ornamental waterfowl to adorn city parks, zoos and estates. Furthermore, Mute Swans are occasionally used in questionable attempts to displace nuisance Canada Geese (*Branta canadensis*). Occasionally, captive or unpinioned Mute Swans escape or disperse and are observed in areas where captive birds are not known to occur. As wild populations of Mute Swans continue to increase, there is an increased probability naturally occurring vagrants may reach Nebraska. A central challenge, though, is distinguishing wild vagrants from escaped captive birds, particularly when evidence is limited and usually circumstantial. We believe understanding the occurrence of wild Mute Swans in Nebraska is important for two reasons. First, tracking putative wild Mute Swans provides potentially useful data for state and local agencies that are also monitoring the situation. Second, the Nebraska Ornithologists' Union Records Committee (NOURC) is charged with maintaining the Official List of Birds of Nebraska, and the question of provenance is critically important when evaluating whether a species' record should or should not be accepted. Here we review the species' status in the Midwest and Nebraska and provide guidance to governmental entities and NOURC on how individual records in Nebraska should be evaluated to determine wild provenance. We also review Nebraska reports and identify those which we believe are wild birds using the aforementioned guidance.

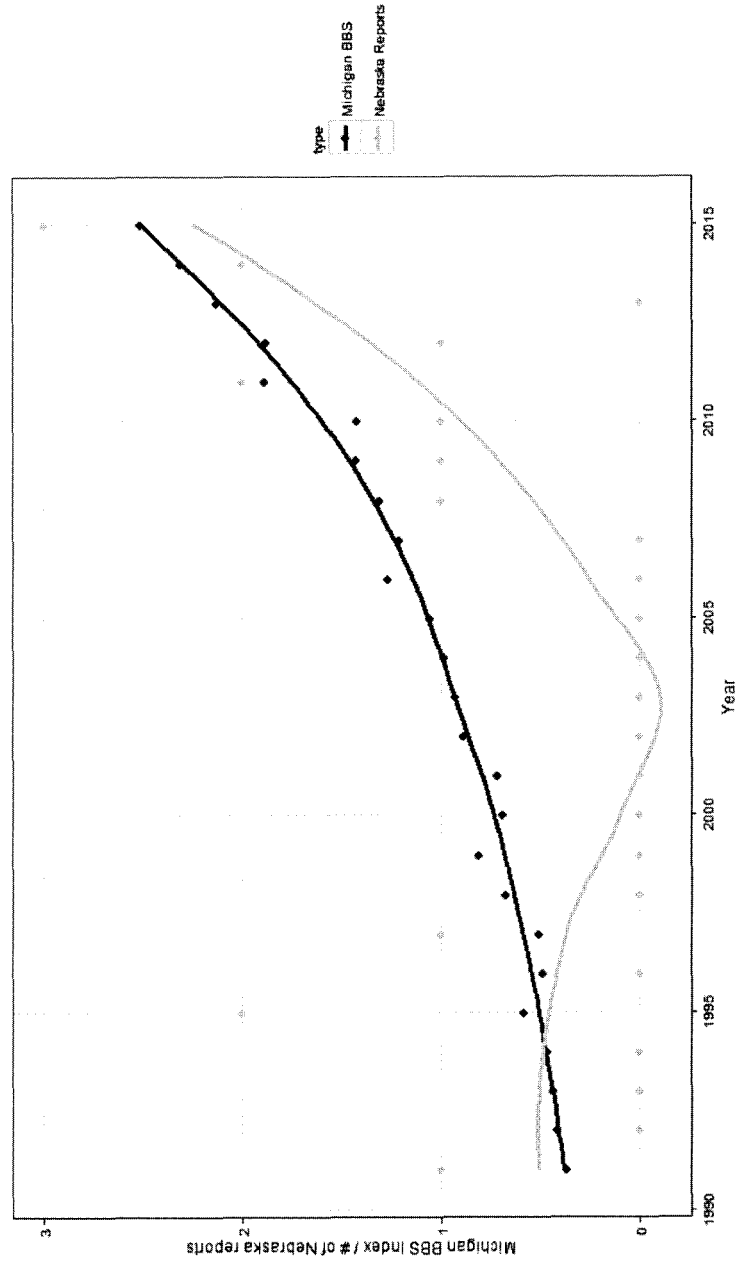


Figure 1. Comparison of Michigan Mute Swan Breeding Bird Survey (BBS) indices and the number of records reported in Nebraska, 1990-2015. Trend lines created using locally weighted scatterplot smoothing (LOESS) in Program R (R Development Core Team 2014).

### Mute Swan Status in Midwest

The Great Lakes population of Mute Swans primarily occurs in the lower peninsula of Michigan and includes Lakes Michigan, Huron and Erie. In Michigan, the primary wintering range for Mute Swans is located near Traverse City, some 1,000 km (600 miles) from eastern Nebraska. Though usually considered sedentary in North America, Mute Swans in Siberia and Mongolia migrate 1650 km (1000 miles) to wintering areas along the Pacific Coast; even some birds wintering at Traverse City fly around 100 miles from breeding areas (Baldassarre 2014). Direct evidence of long-range dispersal from natal areas to the west, however, is limited. An immature banded in Wisconsin July 1984 remained with an adult on the Mississippi River near Winfield, Lincoln County, Missouri, 6 Jan-9 Feb 1985 (Robbins and Easterla 1992). Thus, North American Mute Swans are capable of dispersing larger distances than generally credited to this species, in this case some 560 km (350 miles). Kent and Dinsmore (1996) suggested first-year birds are more likely to disperse; juveniles and non-breeders may travel unknown distances in fall, beginning in September (Ciaranca et al. 1997). O'Donnell (2014) used eBird data of Mute Swan sightings to show evidence of seasonal migration that may result in natural vagrants to the west. O'Donnell (2014) considered that the month-by-month map using eBird data "at least supports ... local winter movements of the species, and I'd even go so far as to say there is evidence that some birds seasonally migrate." Further, he noted "There is ... either a small migration or a pattern of vagrants in winter extending roughly from southern Illinois to central Texas. The western border of the distribution is vague but seems roughly stable throughout the year around the Mississippi River ...". Finally, O'Donnell (2014) concluded, "I think it is reasonable that some of these movements are resulting in natural vagrants to the west. Of course, it is very difficult to identify them, and they will be greatly outnumbered by locally released birds".

In Iowa, the first accepted record of a wild Mute Swan was of one shot in Nov 1962 along the Mississippi River in Muscatine County. The current status of the species in Iowa is "Regular", with most records mid-September through late May, around 18% of these immatures (Kent and Dinsmore 1996). This pattern suggests that Mute Swan is indeed a winter visitor to Iowa.

### Status in Nebraska

Sharpe et al. (2001) considered Mute Swan "Hypothetical" in Nebraska, as, until then, there had been no acceptable reports of non-captive birds. Recently, NOURC added Mute Swan to the Official List of the Birds of Nebraska (Brogie 2015) based on photographs, video, and a description (MB) of a male-female adult pair at a remote farm pond in Dixon County, Nebraska, on 7 November 2014. Both swans

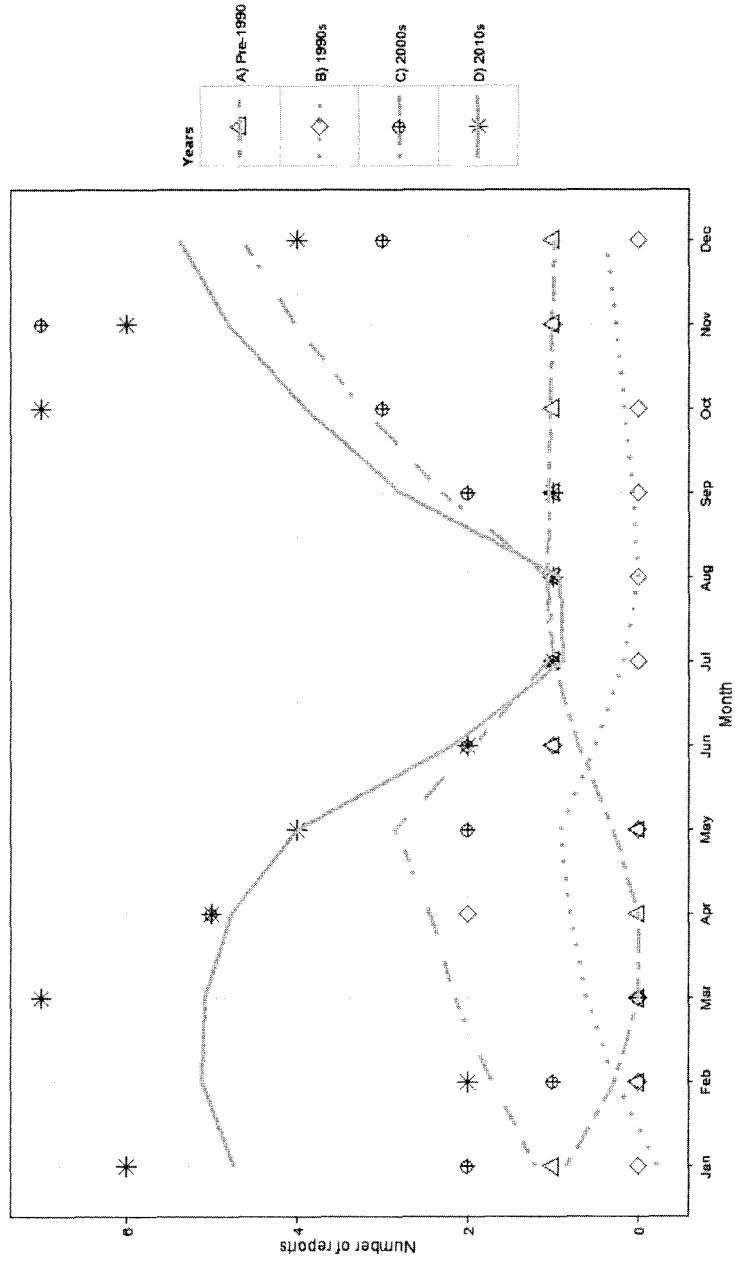


Figure 2. Temporal distribution of Nebraska Mute Swan records by era. Points show underlying data and trend lines were created using locally weighted scatterplot smoothing (LOESS) in Program R (R Development Core Team 2014).

were unbanded, each had both halluces (hind-toes), and both were capable of strong flight. These factors, in conjunction with the birds' age, sex, timing of the sighting, remoteness of the sighting's location, appearance and association with other migrating waterfowl, wary behavior, and increasing populations of wild Mute Swans in states east of Nebraska were indicative of wild provenance (Brogie 2015).

Since the first known Mute Swan record for Nebraska, a "known escape" in 1969 (Bray et al. 1986), there have been 43 sightings reported, 34 of these from 2008 through January 2016 (Table 1). The first Nebraska Mute Swan records that are likely of non-captive birds were in the 1990s, during a period of a rapidly-expanding Michigan population (McPeck and Adams 1994), and the presence of a small free-flying population of 4-5 pairs established around 1980 (Bruce Ehresman, pers. comm. WRS, 2000) in Ida County, Iowa, about 50 km (30 miles) from Nebraska. This population still persists, but with only one mated pair that has not reproduced since approximately 2011 (Don Poggensee, pers. comm. WRS, 1 Jul 2016). Breeding of purported wild Mute Swans has not been reported in Nebraska. Correlation analysis using Michigan Mute Swan Breeding Bird Survey (BBS) indices and the Nebraska records 1990-2015 shows a statistically significant relationship ( $r = 0.58$ ,  $P = 0.002$ ): the number of Nebraska reports has increased along with the population increases in Michigan (Figure 1). Also, a strong temporal pattern has become evident over time as well that indicates increased sightings in the winter months since the 1990s (Figure 2).

#### Guidance on Evaluating Mute Swan Occurrences in Nebraska

We located 43 total reports of Mute Swan in Nebraska (Table 1), with 15 reports of birds that were most likely wild noted in Column 2 of Table 1. We propose the following criteria for judging whether a free-flying Mute Swan is more likely to be a wild bird, and thus a valid record of occurrence in Nebraska. There are three criteria that should be applied, which are listed in order of strength of evidence for occurrence of a wild bird:

1. A marked bird (banded, collared, tagged), that can thus be determined to be from an established wild population. Certain markers may also prove derivation from a captive or research population.
2. An unmarked bird (not banded, collared, or tagged; halluces present) not associating with birds at a location where known captive birds are present, especially if the bird remains for an extended period during the winter.
3. Behavior appropriate for a wild bird (wary, does not approach humans, associated with other wild waterfowl).

#### Discussion

Evaluating the provenance of Mute Swan occurrences away from established populations is a challenge. Few bird species in North America have large, increasing (albeit feral), established populations and are also commonly kept in captivity. Until

recently, it was generally assumed wild, typically sedentary Mute Swans were unlikely to reach Nebraska. Reports of purported wild Mute Swans submitted to NOURC were not accepted because “provenance could not be determined”. Furthermore, predisposed assumptions that Mute Swan occurrences were escapees led to dismissal of many reports that may have indicated wild birds. Several occurrences in recent years are not easily dismissed as captive escapees and suggest there is a need to reconsider how Mute Swan occurrences are evaluated. Wild Mute Swans, which occur less than 500 miles from Nebraska, are capable of long-range dispersal away from breeding areas in fall, even to the extent of repeated migration to wintering locations. Midwest populations also have rapidly increased in recent decades. Together, these points have led us to re-examine Nebraska reports, and we conclude a small number of reports likely involved natural vagrants. We further argue Mute Swan occurrences in Nebraska should be evaluated in an unbiased manner, where it is not simply assumed that birds are escapees.

Bird records committees of states surrounding Nebraska have widely varying approaches to dealing with Mute Swan status, although most (Missouri, Kansas, South Dakota, Colorado) treat reports as of unknown provenance. As noted above, Iowa has for some time, due to its location, recognized the species as regular in occurrence, with most records in winter. Ann Johnson (pers. comm. to WRS) noted that “Since the decision for use [of Mute Swan reports] lies with the seasonal editors ... I suspect most were reported only if the observer felt they were free-flying birds. Not sure how increased eBird usage will affect that.” Missouri, however, assigns “provisional” status to Mute Swan; provisional is defined as “one or more records that meet acceptance criteria, but no definitive state record (i.e., either specimen, diagnostic photograph or audio, or multiple acceptable documentations); or provenance uncertain, in the case of Barnacle Goose, Mute Swan, and American Flamingo.” Apparently the 1985 record cited above does not meet these criteria. Mute Swan is considered “hypothetical” in South Dakota (pers. comm. Dave Swanson to MB), with 3 records described as “origin unknown”, none since 1998 (Tallman et al. 2002). There is no mention of Mute Swan in Kansas in Thompson et al. (2011), but the Kansas Bird Records Committee spent considerable time in 2008 discussing the species, deciding to take a “very conservative approach”; the committee concluded that “until proof of wild origin is found in the state, i.e. neck band from a known wild breeding pair, Mute Swan records will not be circulated for consideration (pers. comm. Chuck Otte to WRS). As in Iowa, most Kansas reports have been in winter, with very few summer reports and nothing indicating breeding (pers. comm. Chuck Otte to WRS). There are no accepted records for Colorado (Colorado Bird Records Committee).

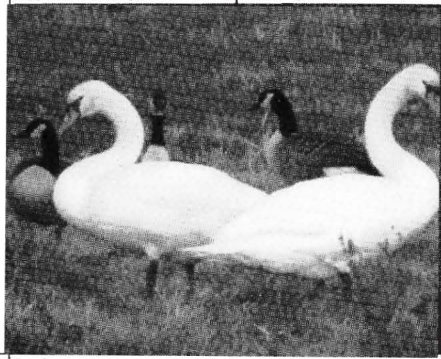
Mute Swan occurrences in Nebraska will continue to be problematic and controversial. Despite efforts to document sightings and determine provenance, uncertainty will remain about the true status of any single record, although it is clear to us there is now an established pattern of vagrancy for the species as a whole. This article is an attempt to resolve this conundrum.

Table 1. Reports of Mute Swan in Nebraska. Reports suggestive of wild provenance are indicated in the second column.

Year	Wild ?	Date of Occurrence	Location	County	#	Age class	
1969		Jun-Sep		Scotts Bluff	1		"Escaped pet" (NBR (38):10-15, Bray et al. 1986).
1982		4 Jan	Near Valley	Douglas	1	imm	Free-flying, known escapee; collected 4 Jan, now in UNO collection (Bray et al. 1986).
1991	Yes	9 Nov	Crystal Cove	Dakota	1	imm	Unmarked; voted Class VI by the NOURC (provenance was not determinable).
1995	Yes	16 Apr	Harvard Marsh	Clay	2	ads	
1995	Yes	30 Apr	Bufflehead WMA	Buffalo	2		T.J. Walker (eBird).
1997	Yes	5-8 Jun	Lake near Odessa	Buffalo	3	ads	Lanny Randolph, Robin Harding.
2004		10 Apr	Leahy Mall	Douglas	2		Bill Hubick (eBird).
2007		Nov	Boys Town Lake	Douglas	2		Sam Manning (pers. comm.): "I went and asked someone at the building on the south side of the lake, and they said that they were captive birds owned by Boys Town."
2008		18 Jun	Con Agra Park	Douglas	6		Two adults with prominent orange bills. Four still-grey offspring. <a href="http://i.imgur.com/RTnQ6VE.jpg">http://i.imgur.com/RTnQ6VE.jpg</a> <a href="http://i.imgur.com/yt0zlpS.jpg">http://i.imgur.com/yt0zlpS.jpg</a> The second adult (not pictured) was farther away, having just been chased by a dog. Megan Riley (eBird).
2008		4-7 Sep	Zorinsky	Douglas	1	ad	
2008		29 Nov	Omaha	Douglas	1	ad	All summer through 29 Nov.
2008		14 Nov	Regency Lake	Douglas	1		
2008	Yes	1-23 Nov	Wehrspann Lake	Sarpy	2	juvs	Unmarked; voted Class VI by the NOURC (provenance was not determinable). These two birds, now adults, were likely the birds seen at Wehrspann L, Sarpy Co, 27 Apr 2009 (J. W. Hall) through Nov 2009 (Jon Strong, m. ob.), and at least a few of the reports of adults in the Omaha area through fall of 2012 (Amy Sheffield photo; Tom Wittman) may have been of these same birds.
2008		4 Sep 2008- 1 Dec 2010		Douglas			Scattered reports of 1-2 adults in the Omaha area. Probably includes Boys Town Lake hosting 2-4 from fall 2008 through 30 Jan 2009, pair there 5 Mar 2011 (Justin Rink) and 29 Dec 2011 through 9 Jan 2012 (Justin Rink).
2009		Fall 2008-30 Jan 2009	Boys Town Lake	Douglas	2-4		One of two there 1 Jan 2008 had a silver band.



2009		21 Jan-16 Feb	Boys Town Lake	Douglas	2		Ralph Morocco (eBird).
2009		11 Apr	Crete	Saline	3	2 ads, imm	At known hobbyists' location (Thomas E. Labeledz).
2009	Yes	27 Apr-Nov 2009	Wehrspann Lake	Sarpy	2	2 <sup>nd</sup> yr	Unmarked; these two birds (1 Nov 2008+), now adults, were likely the birds seen at Wehrspann L, Sarpy Co, 27 Apr 2009 (J. W. Hall) through Nov 2009 (Jon Strong, m. ob.).
2009		30 Apr-1 May	West Omaha	Douglas	2		"Pair".
2010		13 Mar	Venice	Douglas	2	ads	
2010		17-21 Mar	Zorinsky	Douglas	1	juv	"Molting to ad"; may have been the offspring of the Boys Town Lake birds.
2010	Yes	24 Nov-1 Dec	Wehrspann	Sarpy	1		
2011		16 Jan	Grand Island	Hall	1		There has been a small group in the Grand Island area since 1994, when there were 3-5 birds; apparently no young were produced and only one bird remained as of Jan 2011 (Steve Morris).
2011		5 Mar	Boys Town Lake	Douglas	2		"Pair".
2011		10-12 Mar	Yanney Lake	Buffalo	2		M. ob., eBird.
2011	Yes	3 Apr	Blue Hole WMA	Buffalo	2		Anna Fasoli, Alex Lamoreaux (eBird).
2011	Yes	13 Jun	Kissinger WPA	Clay	3	ads	
2011		29 Dec-9 Jan 2012	Boys Town Lake	Douglas	2		
2012		2 May	Leahy Mall	Douglas	2		Dante Trasatti (eBird).
2012	Yes	30 Oct-4 Nov	Zorinsky Lake	Douglas	2	ads	"Near Zorinsky".
2012		14 Oct	Wyuka Cem	Lancaster	2		Ruthie Stearns.
2014		12 Jan	Boys Town Lake	Douglas	2		"Likely captives"; Neal Ratzlaff (eBird): "Two white birds much larger than adjacent Canada Geese with arched neck and knobbed orange bills. Suspect these are captive birds, but don't know that, especially since there are some geese in the mix that are clearly domestics."
2014		16 May	Wyuka Cemetery	Lancaster	2		"Considered exotic"; apparently resident captives there (fide Joel G. Jorgensen). See 2012 record there also.
2014	Yes	4 Oct-2 Nov	Walnut Creek Lake	Sarpy	1	ad	Chris Olson, Doug Begole (eBird).
2014	Yes	7 Nov	Farm pond	Dixon	2	ads	Present about a month prior to 6 Nov; no captive Mute Swans in 29-county area of northeast Nebraska (Clayton Stallings NGPC). The first NOURC accepted record of Mute Swan is represented by photographs, video, and a description (Class I-P, MAB) of a pair (male and female) of adult birds present on a remote farm pond in Dixon Co., 07 November 2014. Both swans were un-banded, each had both halluces (hind-toes) and both were capable of strong flight.

							These factors in conjunction with the birds' age, sex, timing of the sighting, remoteness of the sighting's location, birds' appearance and association with other migrating waterfowl, the birds' wary behavior, and the increasing species numbers to the east were believed indicative of wild provenance. Accession # 1680. <a href="http://www.youtube.com/watch?v=A2-R6Zinwd8&amp;feature=em-upload_owner">http://www.youtube.com/watch?v=A2-R6Zinwd8&amp;feature=em-upload_owner</a>
							
2014		Winter thru 23 Apr 2015	Near Kearney	Buffalo	1	Near-ad	Andrew Furman, Joel G. Jorgensen.
2015	Yes	26 Jan-7 Nov	Crystal Lake	Washington	6	2 ads, 4 juvs	Declining to 5 on 14 Feb and 4 around 20 Sep (Cathy Prettyman); the orange bills of the 2 adults were clearly seen, as were the dark bills and "dirty" look of the juveniles. Also see eBird.
2015		11 Mar-13 May	One Pacific Place	Douglas	7	2 ads, 5 cygnets	Bob Wells (eBird). The captive pair has raised cygnets there for several years; 8 were raised in 2014 but were not seen after mid-Sep (fide Bob Wells).
2015		21 Apr-	Yanney Lake	Buffalo	6	ads, 4 yg	A long-present group at Yanney Lake, Buffalo Co, successfully raised 4 cygnets in 2015 (Barbara Brown).
2015	Yes	4 Oct-1 Nov	Prairie Queen Lake	Sarpy	1	ad	Chris Olson (eBird).
2015		28 Oct	Leahy Mall	Douglas	2	ads	Matthew Spoor (eBird).
2015	Yes	17 Dec-1 Jan 2016	Carter Lake	Douglas	1	ad	Justin Rink (eBird; m. ob.).
2016		27 May	Wyuka Cemetery	Lancaster	1	Ad	Jon Anderson "Likely feral or domestic"

Acknowledgments

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